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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,419	10/03/2003	Neil McLellan	50626.59	1002
43569	7590	09/07/2006		
MAYER, BROWN, ROWE & MAW LLP 1909 K STREET, N.W. WASHINGTON, DC 20006				
			EXAMINER DANG, PHUC T	
			ART UNIT 2818	PAPER NUMBER

DATE MAILED: 09/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/678,419

Applicant(s)

MCLELLAN ET AL.

Examiner

PHUC T. DANG

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on amendment filed April 27, 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

1. This application is a CIP of 10/211,567 filed on August 5, 2002 (Patent No. 6,667,191).

Response to Arguments

2. Applicant's arguments filed on April 27, 2006 have been fully considered but that are not persuasive.

In amendment, Applicants amended claims 1 and 14 and Applicant's arguments with respect to claims 1-17 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections-35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the application regards as his invention.

3. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention.

In claim 1, lines 10-11 "said intermetallic compound..." lacks antecedent basis because an intermetallic compound did not mention before.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary

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skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 11-12 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bernier et al. (U.S. Patent No. 6,069,023) in view of Fan et al. (U.S. Patent No. 6,800,948 B1).

Regarding to claim 1, Figure 4 of Bernier discloses an integrated circuit package comprising a substrate 242 having first and second surfaces and a plurality of conductive traces (Fig. 4) therebetween; a semiconductor die flip-chip 248 mounted to the first surface of the substrate 242 and electrically connected to ones of the conductive traces (Fig. 4) an aluminum alloy (col. 15, lines 35-36) heat spreader 246 fixed to a back side of the semiconductor die 248, and a plurality of contact balls (Fig. 4) disposed on the second surface of the substrate 242, in the form of a ball grid array, ones of the contact balls of the ball grid array being electrically connected with ones of the conductive traces (col. 8, lines 54-62, and Fig. 4).

Bernier does not disclose the intermetallic compound of the intermetallic heat spreader has a modulus of elastic of at least the modulus of elastic of the semiconductor die.

Fan et al., however, disclose an integrated circuit package comprising:

the heat spreader has a modulus of elastic of at least or more than the modulus of elastic of the semiconductor die (col. 2, lines 39-44).

It would have been obvious to one having ordinary skilled in the art at the time the invention was made to modify the teaching of Ma et al. as taught by Fan et al. such the intermetallic compound of the intermetallic heat spreader has a modulus of elastic of at least the modulus of elastic of the semiconductor die for a purpose of improving the integrated circuit package.

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Regarding claims 11-12 and 16-17, claims 11-12 and 16-17 are rejected similar to claim 1 above except for an intermetallic heat spreader having a coefficient of thermal expansion in the range of about 18 ppm/° C to about 26 ppm/° C. However, the selection of the claimed process parameters would have been obvious to one having ordinary skill in the art at the time the invention was made to perform the coefficient of thermal expansion of the heat spreader within the claimed range, since it is well settled that when the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Claims 2-10 and 13-15 are rejected similar to the previous Office action.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuc T. Dang whose telephone number is 571-272-1776. The examiner can normally be reached on 8:00 am-5:00 pm.
6. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harvey O Minsun can be reached on (571) 272-1835. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and Final communications.
8. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

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Phuc T. Dang

A handwritten signature in black ink, appearing to read 'Phuc T. Dang', with a long, sweeping horizontal line extending to the right.

Primary Examiner

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